

## CLAIMS

1. A method for receiving of MPEG-4 data resources broadcast in a European Digital Video Broadcasting (DVB) network, the method comprising:
- 5 at a DVB-Multimedia Home Platform (MHP) terminal, receiving an MPEG-2 Transport Stream (TS), with a packetized DSM-CC User-to-User (U-U) Object Carousel (OC);
- locating a universal resources identifier (URI) in the TS;
- in response to the URI, accessing an address in the DSM-CC
- 10 U-U OC;
- in response to accessing the address, retrieving MPEG-4 resources from the DSM-CC U-U OC; and,
- decoding the MPEG-4 resources.
- 15 2. The method of claim 1 wherein accessing an address in response to the URI includes accessing an address selected from the group including a local identifier (lid) and an http address in the DSM-CC U-U OC.
- 20 3. The method of claim 2 wherein accessing an address includes accessing a lid URI providing a binding name and access scheme to the objects in the DSM-CC U-U OC, as prescribed and restricted by MHP protocols (MHP OC).
- 25 4. The method of claim 3 wherein using lid URIs to provide a binding name and access scheme to the objects in the MHP OC

includes using a lid URI embedded in an Initial Object Descriptor (IOD) to locate resources in the MHP OC selected from the group including a BIFS scene description stream and an object descriptor stream.

5                   5.       The method of claim 4 wherein receiving an MPEG-2 TS, with a packetized MHP OC, includes forming MPEG-4 resources in a hierarchical directory structure.

10                   6.       The method of claim 5 wherein forming a hierarchical directory structure includes forming a hierarchical directory structure of BIOP objects including a DSM::ServiceGateway, a DSM::Directory, DSM::Stream, and a DSM::File.

15                   7.       The method of claim 6 wherein retrieving MPEG-4 resources from the MHP OC, in response to accessing the address, includes:

                    locating a DSI message;  
                    extracting the IOR for the Service Gateway;  
                    parsing the Service Gateway object;  
20                   extracting IORs for Directory, Stream, and File objects from the Service Gateway binding structure; and,  
                    acquiring MPEG-4 resources from the Stream and File objects.

8. The method of claim 3 wherein receiving an MPEG-2 TS, with a packetized MHP OC, includes receiving a first MPEG-2 TS and a second MPEG-2 TS with a packetized MHP OC;

wherein locating a URI in the TS includes retrieving a lid  
5 URI in the first MPEG-2 TS; and,

wherein retrieving MPEG-4 resources from the MHP OC, in response to accessing the lid URI, includes retrieving MPEG-4 resources from the second MPEG-2 TS MHP OC.

10 9. The method of claim 1 wherein retrieving MPEG-4 resources from MHP OC, in response to accessing the address, includes retrieving MPEG-4 resources selected from the group including audio, video, and systems data.

15 10. The method of claim 9 wherein decoding the MPEG-4 resources includes an action selected from the group including enhancing audio data in the MPEG-2 TS, enhancing video data in the MPEG-2 TS, and using the systems data to establish an interactive audiovisual scene and communication link.

20 11. The method of claim 10 further comprising:  
establishing an interactive audiovisual scene and  
communication link in response to decoding MPEG-4 systems data.

25 12. The method of claim 1 further comprising:  
caching the retrieved MPEG-4 resources.

13. The method of claim 3 wherein accessing an address in response to the URI includes additionally accessing an address selected from the group including a local cache address and a Web protocol identifier; and,
- 5 the method further comprising:
- retrieving MPEG-4 resources, in response to accessing the address, from a source selected from the group including a local cache and a website.
- 10
14. A method for broadcasting pointers to MPEG-4 data in a European Digital Video Broadcasting (DVB) network, the method comprising:
- embedding MPEG-4 resources in an DSM-CC User-to-User (U-U) Object Carousel (OC);
- 15 packetizing the DSM-CC U-U OC in an MPEG-2 transport stream (TS);
- generating a universal resource identifier (URI) for accessing MPEG-4 resources located at an address in the DSM-CC U-U OC;
- 20 embedding the URI in an MPEG-2 TS; and,
- broadcasting the MPEG-2 TS, with the packetized DSM-CC U-U OC.

15. The method of claim 14 wherein generating a URI for accessing the MPEG-4 resources includes generating a URI selected from the group including an http address and a local identifier (lid).
- 25

16. The method of claim 15 wherein generating a URI for  
accessing MPEG-4 resources located at an address includes generating a  
lid URI to supply a binding name and access scheme to objects in the  
5 DSM-CC U-U OC, as prescribed and restricted by MHP protocols (MHP  
OC).

17. The method of claim 16 wherein generating a lid URI  
to supply a binding name and access scheme to objects in the MHP OC  
10 includes generating a lid URI embedded in an Initial Object Descriptor  
(IOD) to locate resources in the MHP OC selected from the group  
including a BIFS scene description stream and an object descriptor  
stream.

18. The method of claim 17 wherein embedding MPEG-4  
15 resources in an MHP OC includes forming the MPEG-4 resources  
hierarchical directory structure.

19. The method of claim 18 wherein forming a hierarchical  
20 directory structure includes forming a hierarchical directory structure of  
BIOP objects including a DSM::ServiceGateway, a DSM::Directory,  
DSM::Stream, and a DSM::File.

20. The method of claim 19 wherein embedding MPEG-4  
25 resources in the MHP OC includes:  
loading the MPEG-4 resources into File and Stream objects;

creating IORs for Directory, Stream, and File Objects;  
binding the IORs in a Service Gateway;  
creating an IOR for the Service Gateway; and,  
locating the Service Gateway IOR in a DSI message.

5

21. The method of claim 17 wherein embedding the URI in  
an MPEG-2 TS includes locating a lid URI in a first MPEG-2 TS;

wherein packetizing the MHP OC in an MPEG-2 TS includes  
packetizing the MPEG-4 resources in an MHP OC carried by a second

10 MPEG-2 TS; and,

wherein broadcasting the MPEG-2 TS includes broadcasting  
the first and second MPEG-2 TSs.

22. The method of claim 14 wherein embedding MPEG-4  
15 resources in an MHP OC includes embedding MPEG-4 resources selected  
from the group including audio, video, and systems data.

23. The method of claim 22 wherein embedding MPEG-4  
resources in an MHP OC includes resources used for a purpose selected  
20 from the group including enhanced audio data in the MPEG-2 TS,  
enhanced video data in the MPEG-2 TS, and systems data for the  
establishment of an interactive audiovisual scene and communication  
link.

25 24. The method of claim 14 further comprising:

generating additional URI addresses selected from the group including http and local (receiver) cache addresses for accessing MPEG-4 resources from a website and a local (receiver) cache, respectively.

5                    25.    A European Digital Video Broadcasting (DVB)

Multimedia Home Platform (MHP) terminal for receiving broadcast MPEG-4 data resources, the system comprising:

                    a receiver having an interface for accepting an MPEG-2 transport stream (TS) with an embedded uniform resource indicator (URI)  
10    and a packetized DSM-CC User-to-User (U-U) Object Carousel (OC);

                    an address access unit having an interface to accept the MPEG-2 TS from the receiver, the address access unit locating a URI in the TS, accessing an address, and retrieving MPEG-4 resources from the DSM-CC U-U OC; and,

15                    a decoder having an interface connected to the address access unit for receiving the MPEG-4 resources and an interface for supplying decoded MPEG-4 information.

                    26.    The system of claim 25 wherein the address access  
20    unit locates a URI selected from the group including an http address and a local identifier (lid).

                    27.    The system of claim 26 wherein the address access unit accesses a lid URI providing a binding name and access scheme to  
25    objects in the DSM-CC U-U OC, as prescribed and restricted by MHP protocols (MHP OC).

28. The system of claim 27 wherein the address access unit uses a lid URI embedded in an Initial Object Descriptor (IOD) to locate resources in the MHP OC selected from the group including a BIFS scene description stream and an object descriptor stream.

29. The system of claim 28 wherein the address access unit accesses MPEG-4 resources in a hierarchical directory.

30. The system of claim 29 wherein the address access unit forms a hierarchical directory structure of BIOP objects including a DSM::ServiceGateway, a DSM::Directory, a DSM::Stream, and a DSM::File.

31. The system of claim 30 wherein the address access unit retrieves MPEG-4 resources from the MHP OC as follows:

- locating a DSI message;
- extracting the IOR for the Service Gateway;
- parsing the Service Gateway object;
- extracting IORs for Directory, Stream, and File objects from the Service Gateway binding structure; and,
- acquiring MPEG-4 resources from the Stream and File objects.

32. The system of claim 27 wherein the receiver receives a first MPEG-2 TS and a second MPEG-2 TS with a packetized MHP OC;



wherein the address access unit retrieves the lid URI from the first MPEG-2 TS, and retrieves MPEG-4 resources from the MHP OC in the second MPEG-2 TS.

5                   33.    The system of claim 25 wherein the address access unit retrieves MPEG-4 resources selected from the group including audio, video, and systems data.

10                   34.    The system of claim 35 wherein the decoder supplies MPEG-4 information selected from the group including enhancing audio data in the MPEG-2 TS, enhancing video data in the MPEG-2 TS, and using the systems data to establish an interactive audiovisual scene and communication link.

15                   35.    The system of claim 34 further comprising:  
a transmitter having a transmit interface; and,  
wherein the transmitter and receiver form an interactive audiovisual scene and communication link in response to decoding MPEG-4 systems data.

20                   36.    The system of claim 25 further comprising:  
a local cache have an interface to receive retrieved MPEG-4 resources for storage.

25                   37.    The system of claim 26 wherein the address access unit accesses an address selected from the group including a local cache

address and a Web protocol identifier, and retrieves MPEG-4 resources, in response to accessing the address, from a source selected from the group including a local cache and a network-connected website.

5                   38.    A European Digital Video Broadcasting (DVB) system for transmitting MPEG-4 resources, the system comprising:

                  an address pointer unit (APU) having an interface to supply an MPEG-2 transport stream (TS) with uniform resource identifiers (URIs) for accessing MPEG-4 resources embedded in an DSM-CC User-to-  
10   User (U-U) Object Carousel (OC), and to supply a MPEG-2 TS with the packetized DSM-CC U-U OC; and,

                  a transmitter having an interface to accept the MPEG-2 TS, with the packetized DSM-CC U-U OC from the address pointer unit, and an interface to broadcast the MPEG-2 TS.

15

                  39.    The system of claim 38 wherein the APU supplies an MPEG-2 TS with a URI selected from the group including an http address and a local identifier (lid).

20                   40.    The system of claim 39 wherein the APU generates a lid URI to supply a binding name and access scheme to objects in the DSM-CC U-U OC, as prescribed and restricted by MHP protocols (MHP OC).

25                   41.    The system of claim 40 wherein the APU generates a lid URI embedded in an Initial Object Descriptor (IOD) to locate resources

in the MHP OC selected from the group including a BIFS scene description stream and an object descriptor stream.

42. The system of claim 41 wherein the APU embeds  
5 MPEG-4 resources in an MHP OC by forming the MPEG-4 resources in a hierarchical directory structure.

43. The system of claim 42 wherein the APU forms a hierarchical directory structure of BIOP objects including a  
10 DSM::ServiceGateway, a DSM::Directory, a DSM::Stream, and a DSM::File.

44. The system of claim 43 wherein the APU embeds MPEG-4 resources in the MHP OC as follows:  
15 loading the MPEG-4 resources into File and Stream objects;  
creating IORs for Directory, Stream, and File Objects;  
binding the IORs in a Service Gateway;  
creating an IOR for the Service Gateway; and,  
locating the Service Gateway IOR in a DSI message.

20

45. The system of claim 39 wherein the APU locates a lid URI in a first MPEG-2 TS and embeds MPEG-4 resources in an MHP OC packetized in a second MPEG-2 TS; and,  
wherein the transmitter broadcasts the first and second  
25 MPEG-2 TSs.

46. The system of claim 38 wherein the APU embeds MPEG-4 resources in an MHP OC selected from the group including audio, video, and systems data.

5 47. The system of claim 38 wherein the APU generates additional URI addresses embedded in the MPEG-2 TS selected from including http and local (receiver) cache addresses for accessing MPEG-4 resources from a website and a local (receiver) cache, respectively.